FAA AVIATION NEWS

JUNE 1973

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COVER:
Warm fronts and cold logic. See page 10.

FAA AVIATION NEWS

DEPARTMENT OF TRANSPORTATION/FEDERAL AVIATION ADMINISTRATION VOL. 12, NO. 2

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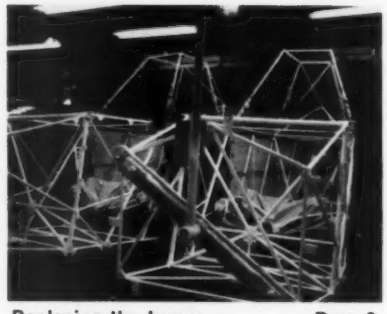

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Beach Buzzer

"Unwarranted Low Flying" Causes Some of the Most Needless of all General Aviation Mishaps

Hardly anyone on the beach that sunny Sunday afternoon paid attention to the small dot that became an airplane droning over the water. Low-flying airplanes along the shore were not unusual; a general aviation airport was just a couple of miles inland. After a while, however, people started watching. The sleek low-wing airplane flew a zig-zag course no more than 50 feet over the boats on the water, finally circling one particular speed-boat. The pilot made a diving pass at the boat, rocking the wings as he climbed away. He circled and repeated the performance several more times, obviously playing games with the boaters who did not seem to be enjoying the performance, since they were now speeding toward the shore.

As the boat approached the dock each pass of the airplane brought it closer to the beach, and to the sunbathers on the sand, who stood up to watch. When the pilot turned away in a steep bank to avoid the hills and trees inland, literally hundreds of witnesses saw the aircraft stall out of the bank and fall into the water, flipping onto its back and sinking within minutes. Coast Guard boats and helicopters recovered the bodies of the three men on board, and notified their families who were vacationing nearby. Seven children were left fatherless in one ill-advised maneuver.

In the annals of aviation accidents this, unfortunately, is not an unusual incident. The onset of fine weather, and the flocking of bathers and boaters to their favorite shore annually brings on a rash of accidents caused by buzzing (or "unwarranted low flying" as it is officially called in NTSB accident reports). In 1971 there were 71 of this type of accident, 38 with fatalities.

The flyer who plays the buzzing game is playing against heavy, if unseen, odds, which catch up to him inevitably, sooner or later. As any ag-plane pilot can tell you, on-the-deck flying requires not only considerable skill but also non-stop concentration—*you must fly the airplane every second;* there is no margin for sightseeing along the way. If your attention is diverted long enough to wave at a friend or admire a shape on the beach, you may easily clip a wire, ram a pole or a tree, or dip a wing in the water.

Judging altitude accurately at low levels over still water or bright sand is extremely difficult, if not impossible. Cases are on record of veteran pilots flying inadvertantly into one or the other. At these altitudes, the altimeter is of doubtful help. An altimeter error of up to 75 feet is considered within tolerances for normal VFR flight. If you plan to level off after a high speed dive, how much do you allow for a lag in the altimeter reading? How close to the local barometric pressure is your present altimeter setting? Even if an instant and accurate altimeter reading were available, how long can you divert your scan from the scene ahead? How often have you lost 50-100 feet in a slipshod turn? Not a good idea at 100 feet above the surface, is it?

Shoreline turbulence is another hidden trap when buzzing beaches. Flying over water is often smooth, due to the absence of convection currents (warm air rising from sun-heated surface of the earth), but the air over the beach may be suddenly quite turbulent. Coming upon this rough air unexpectedly at low altitudes can throw an airplane out of control if the operation is already marginal.

Carburetor ice may be the last thing a joyriding pilot thinks of on a hot day, but if he reduces power to make a slow and low pass without applying carburetor heat he may lose an engine—with little margin for recovery. Moist air and/or low RPMs are a deadly combination.

Low altitude stalls are the ever-present danger in buzzing, whether from engine failure or pilot error. All too often the pilot, in his delight with the impression he is making, loses sight of his airplane's limitations. A steep bank can result in a stall at a surprisingly high speed; a sophisticated single-engine retractable, for instance, which stalls at a modest 63 mph with gear and flaps down and wings level, will have a stall speed of 105 mph clean in a 60 degree turn!

Accident records of the NTSB show that pre-flight drinking and buzzing accidents go hand in hand. Perhaps alcohol brings out the show-off qualities in some pilots, or the suicidal tendencies of others. The combination of impaired judgment *and* efficiency makes them not merely a nuisance but a menace in the air. Death takes no holiday on weekends, so stay clear of beach buzzers and buzzing. ■

Freedom From Fear

On July 2, 1975, a new era in air traffic control will begin.

On that date over 100 terminals and 20 FAA enroute air traffic control centers will be equipped to automatically interrogate and track aircraft utilizing radar beacon transponders with altitude reporting capability. And all aircraft, with few exceptions, using high density terminals or controlled airspace above 12,500 feet, will have the new improved transponders equipped not only to identify the aircraft at each sweep of the radar antenna, but also to report the current altitude in 100 foot increments. The effect of this new equipment on air traffic separation is expected to be nearly as dramatic as the inception of radar itself, over 30 years ago.

A new regulation, effective July 20, 1973, will progressively establish the need for transponders and automatic altitude reporting equipment in certain designated airspace where such equipment will clearly benefit airspace users, expedite the flow of traffic and vastly improve system safety and efficiency. Only aircraft equipped with an operable radar beacon transponder having a Mode 3/A 4096 code capability and a Mode C capability for transmitting pressure altitude information in 100-foot increments will be permitted:

(1) After July 1, 1974, in Group I Terminal Control Areas;

(2) After January 1, 1975, in Group II Terminal Control Areas;

(3) After January 1, 1975, in Group III Terminal Control Areas, unless the aircraft is participating in the ATC system;

(4) After July 1, 1975, in all controlled airspace of the 48 adjacent States and the District of Columbia above 12,500 feet MSL, excluding the airspace at and below 2,500 feet AGL.

Note: Under a regulation already issued transponders *installed* after January 1, 1974, and *all* transponders used in U.S. airspace after July 1, 1975, must meet the standards of the appropriate FAA Technical Standard Order.

The new rule does not apply to helicopters in TCAs below 1,000 feet AGL if operating under a letter of agreement, or to gliders above 12,500 feet MSL but below the positive control area floor of 18,000 feet MSL.

Over the past 20 years radar has been a primary tool for separating traffic. Any sizable target in the sky will return or reflect some of the energy beamed out into space during the radar transmitter's antenna sweep, and this reflection can be shown on the radarscope as a blip of light. With a grid superimposed on the scope, there is no problem about locating the target horizontally from the radar station, and eventually identifying it precisely, with the assistance of radio communications between pilot and controller. When few aircraft are in an area, traffic separation is quite simple, but when the traffic is heavy and consists of a mixture of aircraft with many different speeds and degrees of sophistication, safe separation can become a difficult chore—for the pilot as well as for the controller.

The latter, who often is dealing with half a dozen or more aircraft at the same time, must remember the altitude as well as the intentions of each flight. The pilot, on the other hand, must keep to his assigned altitude, as well as follow specific headings or vectors, while controlling his aircraft and proceeding to his destination.

With automatic altitude reporting equipment in the aircraft, and the new automatic radar tracking systems installed on the ground, these tasks are greatly simplified. The aircraft can be tracked automatically on radar from the moment it enters a controller's sector. Its identification number will appear alongside the position symbol, together with altitude and airspeed data. The controller will be able to tell at a glance the relative distances of one aircraft from another, with regard to altitude as well as azimuth. Aircraft at altitudes that he is not concerned with can be removed selectively from the scope, allowing him to concentrate on the traffic for which he is responsible.

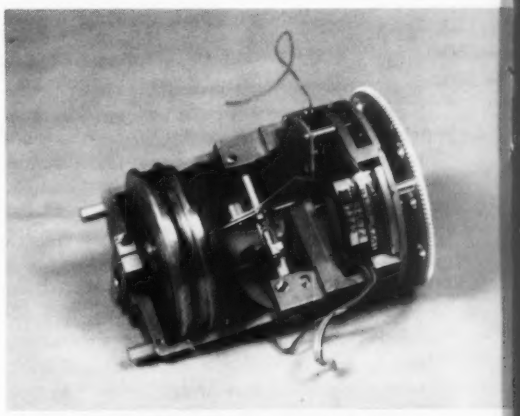
The pilot's task is also simplified in that he is no longer obliged to respond to frequent radio inquiries as to altitude and position, thereby giving him more freedom to concentrate on his cockpit chores and to look out for other aircraft. There is less chance of pilot error stemming, for example, from his not holding his assigned altitude, since altitude changes can be quickly indicated to the controller on the scope.

Other advantages to be derived from automatic altitude reporting equipment include:

• *Less congestion on the frequencies.* With fewer routine transmissions between pilot and controller regarding altitude and identification, the frequencies will be more available for other essential interrogation, clearances, clarification of vectors, emergency calls, etc.

• *Greater safety in case of radio failure.* If the radio fails but there is still power to activate the transponder, an emergency code setting on the latter will immediately inform the controller of a problem, and he will still be able to identify the aircraft on his scope, vector other aircraft away from it, and *most importantly* he will be able to know the aircraft's altitude.

• *Greater vectoring flexibility.* In an emergency, when an aircraft needs to be brought in for a landing in the shortest possible time, the controller who can determine at a glance the altitudes and flight paths of all the aircraft in his sector and can plan the shortest landing path for all aircraft, and especially



Cutaway of encoder, which uses light beams passing through transparent sections of disc to transmit altitude from standard altimeter to transponder, which relays it to radar scope.

distressed aircraft, in a much shorter time.

• *Fewer delays in flight.* In bad weather and at busy peak periods of air traffic, controllers find that workload does not allow them to be concerned about aircraft whose altitude is unknown. Eliminating the factor of unknown altitude will keep the flow of traffic moving more efficiently and safely than has been possible previously.

• *Fail/safe protection.* The chances of human error are much reduced when the altitude and identity can be displayed continuously on the scope, rather than maintained manually or mentally. Correlation studies conducted by the agency have found that the altitude automatically displayed on the controller scope corresponds with indicated altitude in the cockpit as much as 99.6% of the time.

FAA's intention to require altitude reporting equipment for busy terminal areas and the upper segments of controlled airspace has been made known in a series of Notices of Proposed Rulemaking dating back to 1965. The agency has conducted many conferences with aviation users and with industry in proceeding with the program, and has been assured that aircraft operators who act promptly can be equipped with the required transponders well before the scheduled deadline.

In the original proposal, transponders with altitude reporting equipment would have been required in all controlled en route airspace above 10,000 feet, as well as at 63 air terminals. In response to user comments, this requirement was modified to include controlled en route airspace above 12,500 feet, and at 21 TCAs. The dates of implementation were also advanced, to give industry ample opportunity to make the new equipment available at a reasonable price.

At the present time there are approximately 60,000 general aviation transponders in use which can be adapted to altitude reporting capability, at a cost ranging from about $600 to $2,500 depending on the type of encoder installed and the range of altitude reporting needed for the individual aircraft.

Of the 137,000 active civil aircraft in the United States today, it has been estimated that some 40,900 are used in a manner that would necessitate installation of altitude reporting transponders after July 1, 1975. Another 25,000 units might be acquired by aircraft operators on a voluntary basis. A breakdown of the areas to be affected by the new ruling, and the kinds of aircraft in use, is shown at right.

Comments on the new rule have included objections on the grounds that many personal aircraft not equipped with altitude reporting transponders will be unfairly restricted. But FAA has made provisions to permit non-equipped aircraft to operate within the lower density Group III TCAs, when the pilot advises the controller of his position, altitudes and intentions prior to entering the TCA. In any event, the air traffic service facility will be empowered to grant waivers on a four hour notice. Of course, in special circumstances, the controller may grant a waiver immediately.

On the affirmative side, the general use of altitude reporting transponders in virtually all of the busier airspace is expected to usher in an age of unparalleled flight safety, virtually eliminating the potential for a tragic general aviation/air carrier type of midair collision. Operations at the vast majority of the nation's 11,000 airports serving general aviation will be little affected. And as the altitude reporting transponder comes into widespread use, the cost of the equipment will fall to a figure that will make it a very desirable add-on to every safety-minded pilot.

Manufacturers warn that pilots who wait until a few weeks before the deadline to become equipped for their type of operation can expect to experience delays in installation. Normal installation time is about two days in the shop. In view of the fact that a great many major terminal areas already have the ARTS III ground equipment capable of reading out altitude reporting transponders in operation, users of the airspace who equip now can begin enjoying the advantages of the transponder age immediately.

Of the numerous FAA-approved repair stations in the U.S. more than 500 are now rated for transponder service, and many of these are qualified also to install and maintain altitude reporting equipment as well. Aircraft owners may learn from their local GADO the names of the nearest qualified stations.

The complete text of the rule changes, affecting Parts 71 and 91 of the Federal Aviation Regulations, was published in the Federal Register on June 4, 1973. Copies may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price is 20 cents each. FAA personnel at local District Offices and Flight Service Stations will be able to assist pilots in becoming familiar with the requirements.

Group I TCA—Atlanta, Boston, Chicago, Dallas, Los Angeles, Miami, Washington, San Francisco, New York

Category	Total U.S. Aircraft in This Category	% Requiring Alt. Reporting	# Altitude Reporting Components
Commuter Air Taxi	1,000	60%	600
Non Scheduled Air Taxi	4,500	30%	1,350
Government Civil A/C	2,300	100%	2,300
Air Carrier	2,800	100%	2,800
Corporation/Executive	8,000	100%	8,000
Business	39,000	20%	7,800
Personal	79,000	5%	4,000
Total	137,600		26,850
			—5,000*
			21,850

*Approximate number of units now in service

Group II TCA (To be implemented)—Cleveland, Denver, Detroit, Houston, Kansas City, Las Vegas, Minneapolis, New Orleans, Philadelphia, Pittsburgh, Seattle, St. Louis

Commuter Air Taxi	1,000	40%	400
Non Scheduled Air Taxi	4,500	30%	1,350
Business	39,000	20%	7,800
Personal	79,000	10%	7,900
			17,450

Group III TCA (42 locations to be implemented)

Non Scheduled Air Taxi	4,500	30%	1,350
Business	39,000	20%	7,800
Personal	79,000	20%	15,800
			24,950**

**non mandatory

En Route

Nearly all of the aircraft affected by the en route requirement above 12,500 would already have an altitude reporting transponder due to Group I, II, and III TCA requirements. Added impact to users for the en route requirement is estimated to affect at most 2% of the personal aircraft, or about 1,600 units. Total encoders to meet mandatory fleet requirements for terminal and en route operation after July 1, 1975—**40,900**
Total encoders to meet requirements plus Group III TCA (non mandatory)—65,850

A Grumman **Goose** was downed near Puerto Rico by an unsuspected fuel line problem.

Public "Eyes"

(Editor's note: An earlier article on this subject, in the May issue of FAA AVIATION NEWS, *discussed the responsibilities for aircraft accident investigation and the techniques employed. Today's article goes into the training of accident investigators, and their contributions to safe flying.)*

Aircraft accidents are investigated thoroughly in order to prevent their repetition, but occasionally the clues to the puzzle are so subtle or apparently non-existent that even the experts of the National Transportation Safety Board and the FAA field inspectors may be temporarily stumped. In some rare cases, it is only after the accident repeats itself and a pattern is established that the precise or probable cause is determined.

A recent example of this type involved an air taxi amphibian Grumann *Goose* in service in the Caribbean. In June of 1971 the twin engine air taxi, with a pilot and ten passengers on board, crashed in the sea off Puerto Rico. The airplane had departed St. Thomas at 3:47 p.m. and at 4:00 p.m. it was two miles northeast of Puerto Rico near Culebra Island when the engines failed. The pilot tried desperately to restart, switching his fuel tanks, but he was unsuccessful. He radioed a Mayday signal and instructed his passengers to don their life vests.

Although the weather was fair and the sea moderate, unluckily a swell caught the left wing float on impact, causing the *Goose* to "ground-loop" and tearing away the bow section. The pilot was flung out of the open bow with a force that broke both of his legs. He saw the passengers scrambling out of the cabin, and counted eight of them floating safely with their life vests in the 75 degree water. Two other passengers, without vests, sat on the broken wing petrified with fear, ignoring his shouting to jump. Navigating as best he could with his broken legs, he started to swim towards them, shouting at them all the while. But before he reached the plane it suddenly slipped beneath the surface, taking the two passengers with it. They were never found again. Within a few hours all the remaining survivors were picked up by Navy and Coast Guard helicopters.

The investigation was a frustrating one. The plane had sunk in over 200 feet of water, and it was never recovered; there was no wreckage to examine. The captain, an experienced and qualified pilot, was unable to offer any explanation for the engine failure, and the ground crew at St. Thomas testified that there had been more than adequate fuel on board for the short flight. Power plant failure was obvious. But without access to the engines, probable cause could not be determined.

But three months later another airplane of the same type had a similar power failure near St. Croix, and this time there was hope that the mystery could be solved. The air taxi had taken off in the early afternoon on a flight from San Juan to Cristiansted with a pilot and three passengers on board. About 20 miles northwest of St. Croix the engines failed and the pilot was unable to re-start. But this time the landing of the amphib in the open sea was a successful one, and the plane floated easily on the surface. After some minutes the pilot found he *was* able to get the engines started again, and he began to taxi toward land. His emergency signal had been heard, however, and a nearby fishing craft took off the passengers as a precaution. But the pilot was able to taxi the plane back to the dock. He could not explain why the engines failed, but he felt it was probably some contaminate in the fuel tanks.

That would not do for the NTSB, and although they seldom investigate "incidents" they decided to investigate this one in light of the earlier *Goose* accident of some three months previous. (An "incident", as opposed to an "accident", is an episode in which there is no substantial aircraft damage and no personal injury.) The plane was ferried to a large hangar at St. Thomas and investigators began to break it down to examine the fuel system and power plant. During the power tests the main fuel inlet pipes were found to be hot to the touch, but when the fuel crossfeed valve was turned to "off" the pipes cooled. A mockup of the fuel system was then built, using fuel pumps from the original plane, and a pressure differential between the fuel pumps are noted which seemed to be causing a back flow, resulting in high localized fuel temperatures when the crossfeed valve was open. This, of course, could cause vapor lock and fuel starvation in both engines. (The manual for this type of plane instructed the pilot to fly with the crossfeed valve open.) Since the St. Croix emergency landing was only an incident, NTSB did not issue a report of probable cause, but it did make recommendations to FAA, which in turn issued an Airworthiness Directive instructing all owners of the airplane to affix a placard near the instrument panel reading: "Cross feed valve must be closed during all flight operations except for emergencies resulting from engine pump failure." To date, there have been no further reported episodes of engine failure on that airplane. The puzzle had been solved.

Anyone with technical competence, an aviation background, infinite patience, and a lively curiosity is a potential accident investigator, but those who qualify for that task with FAA or the National Transportation Safety Board undergo careful training. NTSB personnel have been trained at the

Airline stewardess who survived a crash at Chicago O'Hare Airport testifies at the National Transportation Safety Board hearing.

National Aircraft Accident Investigation School, located at Dulles International Airport near Washington, D.C. It is an intensive four-week course, eight hours a day, five days a week, in which future investigators are trained in all aspects of accident investigation. The course is also open, on a space available basis, to foreign aviation experts, to representatives of various manufacturing firms which want to participate in accident investigations involving their own planes, and to members of state aviation authorities.

Above—instructors at the DOT Safety Institute at Oklahoma City review tell-tale marks on compressor blades of jet engine used in training. Below—the trained investigator can learn volumes from examining a few dents on a cylinder head of a wrecked airplane.

Not all investigation takes place at the crash site. Suspicious fragments or parts are sent to various laboratories for examination.

The great majority of students are pilots, and the non-pilots are usually experts in such fields as metallurgy or aerodynamics. There is a high percentage of military-trained pilots among NTSB investigators, most of whom have previously served as Flight Safety Officers.

The training facilities at Dulles are equipped with a laboratory and audio-visual aids. There are also a number of parts —propellers, engines, fuel systems, etc.— which have been retrieved from accidents and which are used for demonstration purposes. The lectures treat such topics as the legal aspects of an investigation, aerodynamics, metallurgy, powerplant and structure and systems investigation, weather factors, human factors, and reporting procedures. The future investigators are also trained to take pictures of the wreckage, and they are given a special course in the techniques of interrogating witnesses.

The final examination at the Dulles NTSB school involves the investigation of a wrecked airplane—the actual wreckage of a small single engine aircraft which crashed a few years ago in Pennsylvania, killing two people. The wreckage was brought to Dulles, and distributed in the woods exactly as it was found at the original accident site. Students make their investigation, while instructors act out the part of witnesses, using actual testimony given at the original accident. Each student is asked to submit his probable cause. If his deductions are correct, he is certified as a qualified aviation accident investigator.

FAA's Flight Standards field inspectors all receive their training in accident investigation at the DOT Transportation Safety Institute at Oklahoma City, Okla. There is a basic two week course in investigation procedures, and another two week course on techniques of aircraft accident investigation. Training includes familiarization with flight and voice recorders, preparation of materials for lab study, and photographic documentation, as well as a thorough review of engine and airframe systems, flight operations, aircraft performance and FAA procedures.

There are many similarities in the training of FAA and NTSB accident investigators, but they are governed by a different perspective. The NTSB is concerned with determining a "probable cause" of the accident, as well as related causal factors. These findings may not be used in any legal action, but are developed largely for the purpose of recommending action to regulatory agencies, such as FAA.

FAA's investigations are concerned with the agency's responsibilities for airmen, aircraft, NAVAIDs and regulations. FAA inspectors check carefully on such matters as proper certification, acceptable standards of material and work, accuracy of instruments, and adherence to approved procedures. FAA investigations are not cause-oriented but seek to identify any deficiency in order that corrective action may be taken immediately to improve aviation safety.

Regardless of the objective of an accident investigation, the ultimate purpose is to save lives and property by preventing the repetition of the accident. Consequently it behooves all pilots and all persons involved in aviation to cooperate fully with investigation teams. You may be certain the information you give will be used to help you, not hurt you. It could save a life.

CIVIL AIRCRAFT ACCIDENT PLAN

GUIDELINES FOR LOCAL AND STATE AUTHORITIES, CORONERS AND MEDICAL EXAMINERS

RESCUE: The occupants

GUARD: The wreckage—Allow no one inside the wreckage area other than those necessary for occupant removal, firefighting, and the possible removal of mail and cargo when necessary to protect it from further damage. Items removed for protection must be retained locally for examination by a Federal Air Safety Investigator.

ADVISE: The County Coroner/Medical Examiners—Fatally injured occupants of the aircraft should be held for possible pathological and/or toxicological examination prior to embalmment.

IDENTIFY: The position of fatalities—Prior to removing the remains of fatally injured occupants, tag or otherwise identify each body, and mark its location in the wreckage or on the ground (Photograph in position, if possible).

PERMIT: News media coverage—Accredited news media may be permitted to enter and photograph the area as long as the wreckage is not disturbed.

NOTIFY: The local authorities—NTSB-FAA

Unsung Heroes

Saving the airplane from the scrap-heap is not the task of the pilot alone.

Charles Macha, literally up to his elbows at work, has originated many design modifications.

What do you do when the steel framework that holds your airplane together shows signs of deteriorating beyond the point of airworthiness, and you are told it is probably rust *inside* the steel tubing that is creating the problem? Replace the entire truss frame at virtually the market price of the airplane—or abandon it?

Before you scuttle your craft, you might get in touch with Charles A. Macha, of San Antonio, Tex., the trouble-shooting ace of the maintenance department at Nayak Aviation Corp. on the San Antonio International Airport. Charles is the national winner of the FAA Aviation Mechanic Safety Award for 1972 in the general aviation class. He is also maintenance shop superintendent and designer of aircraft innovations for Nayak as well as designated FAA examiner for Airframe and Powerplant Mechanics. Charles is not easily stumped by a maintenance problem. In his more than 30 years as aircraft mechanic, both in military and civilian life, he has earned an enviable reputation for the ingenuity and precision of his work.

As a matter of fact he has been instrumental in the development of 19 *supplemental type certificates* (STC), most of which were directly concerned with safety. (An STC is necessary whenever a change is made in the engineering procedures contained in the original type certificate for that aircraft.) In the past year Charles has developed three significant repairs and modifications, all of which have had ready acceptance by aircraft owners, operators and manufacturers. These specific cases were detailed in the nomination of Macha for Mechanic Award winner.

About a year ago, a middle-aged Piper *Apache* was brought to Macha with extensive corrosion damage to the steel truss fuselage frame. The owner had been advised that the frame was beyond repair and would have to be replaced—a procedure that seemed economically impractical because it would probably cost more in parts and labor than the plane was worth. Macha turned his attention and expertise not only to finding a practical solution for this aircraft but also to developing a test that would anticipate impending internal corrosion in time to prevent serious and expensive repairs on any craft with a frame of welded steel tubing.

For the *Apache* which was his immediate concern he worked out a way to cut out the obviously deteriorated parts of the framework, and replace them with new steel tubing. Of equal concern, however, was the rusted area *inside* the hollow tubing of airplane framework, invisible to inspection. Macha drilled strategically-placed holes in the framework, and forced air through the frame. Wherever flakes of rust came out with the air, he concluded that internal corrosion existed. Oil was then forced inside the tubing to coat the interior and stop the deterioration. Excess oil was allowed to drain, then the holes were carefully resealed.

Forcing air through the frame tubing proved to be not only a means of checking on corrosion, but also as a test for new aircraft frames to make certain all the welds are air-tight (thus eliminating the possibility of moisture getting inside). The method, in fact, has been adopted by Piper for all production-line aircraft with welded steel truss frames.

Another example of Macha's ingenuity involved a cracked and buckled rib assembly in the landing gear box of a *Navajo*. Normally a repair of this nature requires complete dismantling of the aircraft wing structure, but Charles devised a way of reinforcing the damaged rib with a sound rib, without extensive disassembly of the wing. The result was a considerable savings in time —and of course, repair bills. Down time was reduced from two and a half weeks to four

days, with a saving of about $3,000 per airplane. This repair, too, has been accepted and recommended by Piper Aircraft Corp., and two other aircraft which suffered similar damage were also repaired in the Nayak shop.

The third case cited in support of Charles Macha's nomination for his award concerned the power source of a Beech *Queen Air*. Macha was able to save the aircraft's owner considerable expense by providing adequate power from two 12-volt lead-acid batteries in place of the originally installed NICAD battery, and obtaining a Supplemental Type Certificate for his modification. He has now made similar installations in other *Queen Airs*, and all the customers are well-satisfied.

Macha's boss, Elton Rust, President of Nayak Aviation Corp. says that Macha's intense concern for aviation safety has been an inspiring influence on his fellow workers. Moreover he sets an excellent example to others by establishing sound shop procedures and practices.

A native of San Antonio, Charles Macha has been interested in mechanical work since early childhood. After his high school graduation he became an automobile mechanic at a local garage. But he could not forget an airplane ride he had taken when he was about eleven years old and in 1938, when an acquaintance told him of a job that was open for a line-boy and an airplane mechanic's helper at the airport, he rushed out and applied.

Soon he was taking flying lessons, and he had his private license before World War II began. During the war he served as an airplane mechanic in the Army Air Corps in Australia and the Philippines, and after the war he came back to aviation maintenance in civilian life, specializing in general aviation airplanes. By 1961, when he obtained his present position at Nayak, he had earned his Inspection Authorization. Since 1967 he has been a Designated FAA Examiner for Airframe and Powerplant Mechanics.

To pilot/mechanic Charles Macha aviation safety has always been an overriding concern—a "calling" to which he feels dedicated. On the lighter side, his favorite form of relaxation is square dancing and he has quite a reputation as a "caller" in that folk form.

Macha and his wife, along with Burrus Rich, of Eastern Airlines in Miami, the winner in the air carrier class, will be flown to Washington to receive their prizes in the FAA Aviation Mechanic Safety Award competition. They will each receive handsome plaques, cash awards and many material gifts, including matched tool sets, and tool boxes. Then each will fly back to his hometown and the daily battle with the forces of attrition in aviation.

1972 Regional General Aviation Winners

Alaska:
Ernest E. Hubbard, Bachner's Aircraft Service, Fairbanks, devised a method for using metal tubing to reinforce the longerons (lengthwise framework) of Super Cubs which were being damaged by sideloads from the use of oversize tailwheels and tail skis, while operating on rough and frozen surfaces.

Pacific:
Clarence J. Sury, Honolulu, developed a total maintenance program for the 12 airplanes of the Hickham-Wheeler Aero Club. He set up an engine overhaul shop, a library of pertinent reference material, a system for compliance with Airworthiness Directives, and a timetable for interior aircraft care.

Western:
Richard Packard, Aviation Specialties, Inc. of Mesa, Ariz. has made several certificated changes in the many planes he helps maintain. For a large fleet of civilian fire-fighting B-17s he designed fire-retardant tanks and a precise drop system (for triggering the doors, at appropriate altitude and speed).

Southern:
Rex R. Barnes, Fort Rucker, Ala. noted the many maintenance manhours which were involved in removing the Proximity Warning Devices (PWD) from helicopters for purposes of testing. His time-saving solution was to develop a method of checking the PWD's in the aircraft on the ramp.

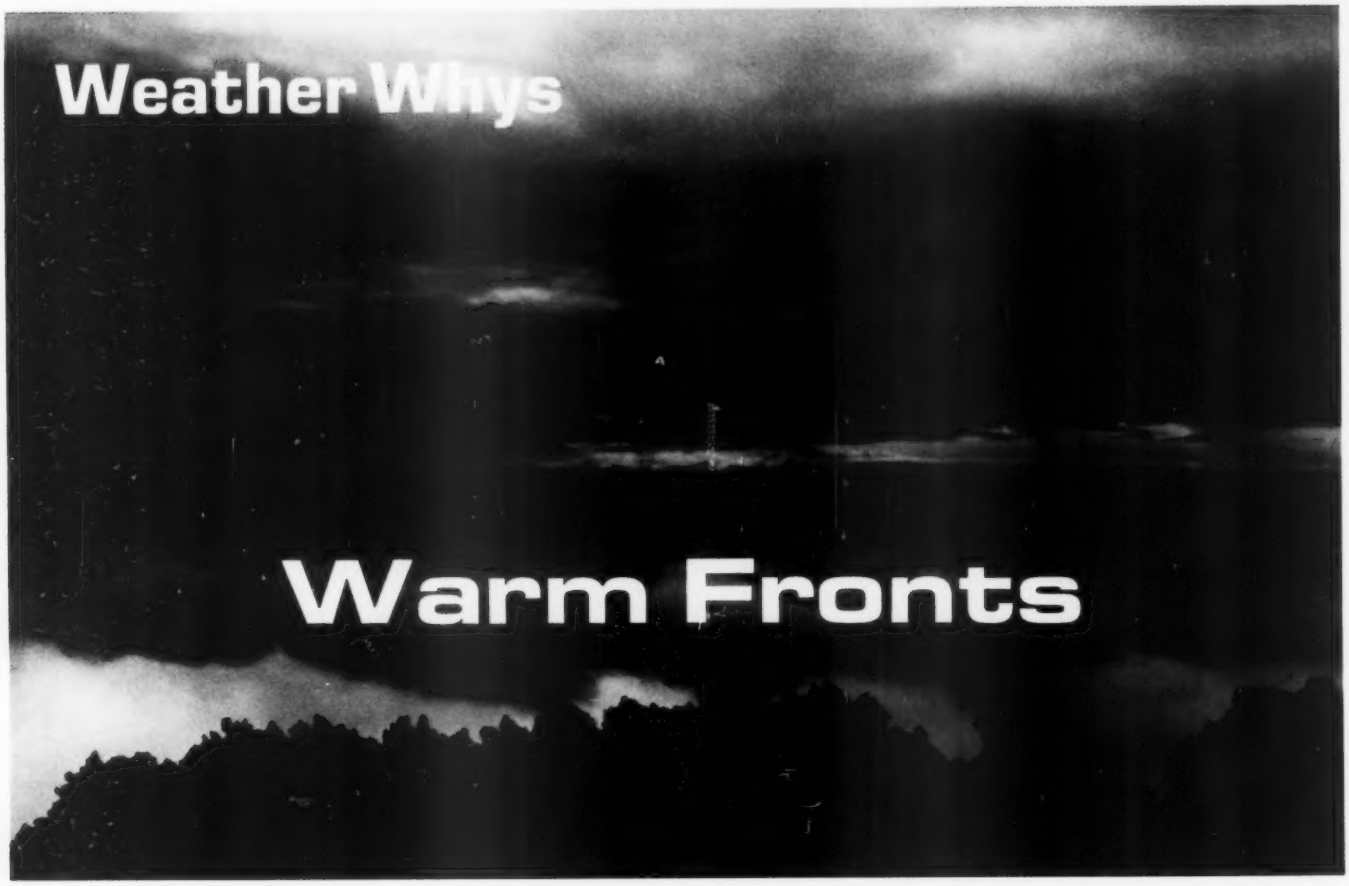
Rocky Mountain:
Eugene Schacher, who is a pilot/mechanic for Midwest Oil Corp. of Denver, Colo., designed a method of rerouting warm cabin air to prevent the brushes from icing in the AC generator, which furnishes power for the windshield heat on the Sabreliner model 40.

Central:
Donald "Jack" Morris, Meisinger Beechcraft, Kansas City, has developed ingenious but simple test items, including one for checking gear and flap motors on the bench. His static system test involves use of suction cups over the static port and vacuum pump for more accurate readings.

Great Lakes:
Layman J. Albright, Hartzog Aviation, Rockford, Ill. was alerted to a problem involving the oil dipstick and cap not being properly inserted and secured in the Beech King Air 90. He solved the problem by installing a warning light on the panel, which signals if the dipstick is not secure.

Eastern:
George Cooperstein of C & P Airways, Inc., Baltimore, over the past 30 years has demonstrated such skill that he is often consulted by other mechanics. He designed new tools for working on helicopters, and created a standard system of shop procedures for their maintenance.

New England:
William Bleil, Sprague Aviation, North Adams, Mass., is a master troubleshooter. He has developed several innovative repairs, among them an improved seal for an inspection door to keep moisture out, thus preventing electronic failure, and a better method of adjusting King Air brakes.



Warm fronts are less violent, but extend over a broader area than cold fronts.

This is the third in a series of articles on aviation weather prepared by meteorologists of the National Weather Service.

The warm front is a gentle relative of the cold front, moving in a slow, orderly way and announcing its arrival well in advance. Although its effects are usually less violent than those produced by a cold front, its influence extends over a much broader area. As a result, it can be a trouble-maker for the unwary pilot.

A warm front is the leading edge of a mass of warm air that is overtaking and replacing cooler air. In the wintertime, the temperature of this "warm" air may be below zero and still be warmer than the air it replaces. In summer, this air temperature may be in the 90s.

Normally, warm air masses come from the south and are caught up by winds blowing toward the east. Thus, a warm front in the United States generally moves from southwest to northeast.

Because warm air is lighter and less dense than cold air, warm air has to work hard to displace cold air. For this reason, warm fronts travel at a slow pace—15 to 20 miles per hour on the average.

As the light, warm air flows over cold air in a gently sloping wedge pattern, it produces an orderly progression of clouds that gives the pilot plenty of warning. If he is alert, he can recognize the signs of an approaching front before he gets into it.

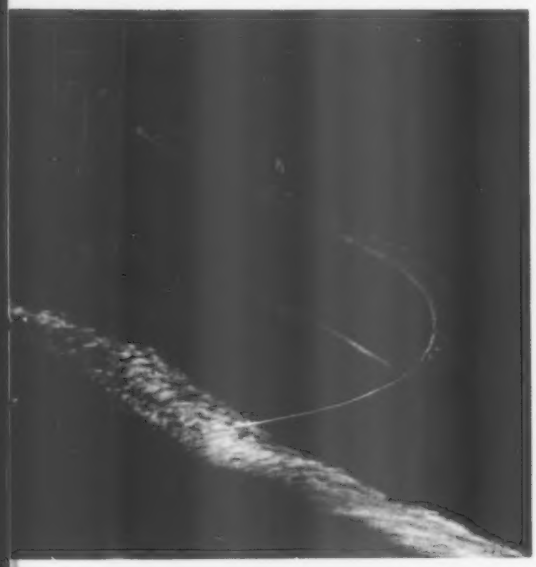
On the ground, a sequence of gradual changes accompanies the approach of a warm front. Often, after several clear days, high-flying jets begin leaving condensation trails in the sky. These "contrails" are the result of the condensation of water vapor that accompanies engine combustion at high altitudes. At first, the contrails are short and disappear quickly. During the day, they tend to lengthen and persist, sometimes spreading and forming cloud layers. Careful observation with the aid of sunglasses may reveal thin, delicate cirrus clouds over most of the sky, althought a casual observer would call the sky clear.

As the warm front moves nearer, cirrostratus cloud cover creates a halo around the sun. Visibility decreases and distant objects become hazy and indistinct. Winds tend to blow from a southerly direction, slowly gaining in strength. Clouds gradually thicken and lower until the sun disappears. Visibility decreases further, winds intensify, and precipitation begins.

In flight, the first indications of an approaching warm front are thin, high cirrus clouds that persist and tend to become thicker toward the horizon. The leading edge of the continuous layer of cirrostratus is roughly parallel to the intersection of the frontal surface with the ground, providing a clue to the orientation of the front.

Closer to the front, the high-level cirrostratus gradually becomes middle-level altostratus or mixed altostratus-altocumulus clouds, hiding the sun. Even lower level clouds such as nimbostratus and stratocumulus appear. As these lower layers merge into a solid cloud mass, precipitation begins or increases in intensity. The cloud mass may slope all the way to the ground. The pliot who tries to sneak under may be in for a surprise.

A VFR pilot can find himself trapped where the cloud layers suddenly merge. He may lose all visual reference to the horizon before he has a chance to execute a 180 degree turn.



Familiar contrails that often foretell a warm front. Another warning is the gradual merging of stratus cloud layers into a solid mass.

In a cold front, warm air is pushed upward by the wedge of cold air underneath. Warm air overtaking cold is lifted more gradually. Warm fronts, therefore, are generally of a milder nature than cold fronts. An exception occurs when the warm air is unstable.

In a stable atmosphere the normal flow of the winds tend to be horizontal. A stable atmosphere resists any upward or downward displacement and tends to return to normal horizontal flow. An unstable atmosphere allows upward and downward disturbances to grow. Stability, then, is the tendency of the atmosphere to resist vertical motion. It depends on the relative density of the air at various levels and also on the changes in density which may take place at various levels.

When unstable warm air overtakes cold air, thunderstorms often develop. As the warm air glides up the frontal surface it rises to levels where it is warmer and lighter than the surrounding air, thus increasing its buoyancy. As a consequence, rapid turnover develops, including strong up and down currents, and a thunderstorm is born. The thunderstorm may be embedded within the solid cloud structures, hidden from a pilot's view. The unwary VFR pilot, trapped between layers, faces the possibility of running into the thunderstorm while trying to extricate himself.

Warm fronts, as a rule, spread low ceilings, poor visibilities, and precipitation over extensive areas. If the warm air is sufficiently moist, the precipitation area may precede the front by a hundred miles or more.

A pilot flying through a warm front should plan to be on instruments for some time. He cannot expect to find rapid improvement in surface conditions on either side of the front. Visibility is often poor in the warm air behind the front, and marginal weather is quite extensive in the cool air ahead of the front. When heading for an airport on the warm side of the front, it is wise to *check on two alternate airports in case one should go below minimums.*

Extensive areas of freezing rain or drizzle are often associated with winter warm fronts. These can be troublesome even to large aircraft equipped with de-icing gear. A small aircraft without de-icers may build up an unmanageable load of ice in a few minutes of freezing rain. When this occurs, and wide areas underneath report less than landing minimums, IFR pilots may escape icing conditions by climbing into the warm air aloft.

VFR pilots should not plan to fly under an active warm front because ceilings often lower to the surface. Extensive cloud cover also makes it unwise to attempt VFR on top. The best policy is to land at an open airport and wait out the front's passage.

After a warm front has passed, the air is noticeably warmer and more humid. Visibility usually remains restricted to some extent, although the sky may clear considerably. Surface winds blow from a more westerly direction. When the area between the warm front and a following cold front is large, weather improves slowly for perhaps a day or two before the approaching cold front makes its presence known. When the warm front is followed closely by a cold front, the period of mild improving weather may be brief or there may be no perceptible improvement in flying weather until the cold front has passed.

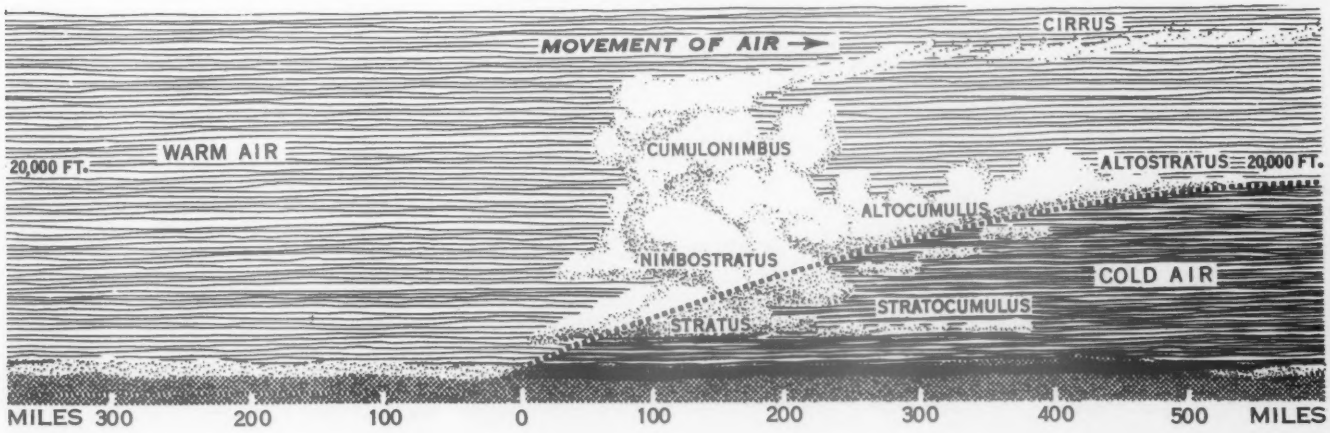
These weather patterns are generalized and fit only a small number of actual situations. In reality, conditions vary widely from case to case. Each frontal situation should be evaluated on an individual basis using the available weather reports, forecasts, and advisories and considering the limitations of the pilot and his aircraft.

When flying in warm frontal condition:

- Beware of freezing precipitation and check frequently for icing;
- Determine the best flight level before penetrating the warm front. As a general rule, fly high (above 18,000 feet) or low (below 6,000) to avoid icing and turbulence;
- When flying toward an approaching warm front, expect ceilings to lower at the rate of at least 5,000 feet every 100 miles;
- Fly the most direct course across the front;
- Prepare for prolonged instrument flight. You can't plan to be IFR for just a minute or two;
- Remember that as you fly toward a front, it is moving also. Learn its direction of movement and compute your rate of closure;
- Land early in the day to avoid being trapped. In pre-warm front conditions, ceilings and visibilities often lower abruptly with the onset of darkness.

Next month—Occluded Fronts

Typical Pattern of a Warm Front



Famous
Flights

The S-42

Igor Sikorsky's Flying Clipper

The barrier to expanding the airways west of California had always been that awesome first leg, 2,400 miles of open, windswept ocean beyond San Francisco's Golden Gate. To span the Pacific with mail and passengers, an airplane had to reach Hawaii first. It had to reach Hawaii, not with tanks draining, but with ample reserves of fuel and a profitable payload.

No airplane could do that until Igor I. Sikorsky, emigrant son of a Russian baron, designed the S-42 flying boat, the famous *Flying Clipper*, the first aircraft to establish the practical superiority of the aircraft for long range commercial travel. S-42s shrank the vast Pacific to a traversable pond, although that was not the plane's original purpose.

In 1930 Pan American Airways had wanted a flying boat that could carry 32 passengers across the Atlantic, via the stepping-stone route from New York to Bermuda, to the Azores, to Portugal. Airline specifications called for a boat capable of *flying 2,500 miles against a 30 mph headwind*—an unheard of requirement in those days.

But Sikorsky fulfilled it. Design work began in late 1931, construction in 1932. By 1933, the first S-42 was completed. Larger, faster, more efficient than its flying boat predecessors, the sleek S-42 set ten international records before it entered airline service. Eight were set in a single day.

That triumphant day was August 1, 1934. Col. Charles A. Lindbergh had driven all night to reach Bridgeport, Conn., and the Housatonic River where the S-42 had her berth. He was to share piloting duties aboard the history-making flight with Sikorsky. A flight mechanic unshipped the Jacob's Ladder astern, slammed shut the hatches. High above and behind the pilot's station, the four 750 hp Pratt & Whitney *Hornets* roared into life. A crewman cast off the mooring lines. Down in the S-42's cargo compartment were 4,400 pounds of sand and iron bars, to simulate a payload.

Into the wind, full throttle, up on the step and off. The S-42 pivoted over the Stratford lighthouse and headed east toward the George Washington bridge between Manhattan and New Jersey. Then south to Staten Island, east to Block Island and back to Stratford, a total distance of 311 miles.

Four times around it went, and when the S-42 splashed down, after eight hours aloft, the United States held more world flying records than any other nation. To cite just two: weighing 33,500 pounds, the S-42 climbed to 20,406 feet in one hour flat. In averaging 157.7 mph over a 1,000 kilometer course, the S-42 bettered the old record by 20 mph. Not the records, but how astonishingly far the S-42 pushed the frontiers of aviation technology is the point to be remembered.

A noted British designer of the time compared the American plane with the Short *Empire*, considered in 1934 the premier British flying boat:

"In spite of the fact that the S-42 has rather less horsepower in proportion to its weight, its cruising speed is 52 mph faster than that of the English boat; the speed of the S-42 with one of its engines stopped is 20 mph faster than that of the English boat with all engines operating at full power. The S-42 carries nearly 1,000 pounds more payload in addition to fuel for 550 miles increased range . . . the new Atlantic liner *Queen Mary* possesses hardly so great an advantage over the so-called Atlantic greyhounds of the last century as the S-42 possesses over the English flying boat."

Igor Sikorsky, in 1957, with models of his earlier day four-engine S-40 amphibian Transport and other aircraft he helped develop.

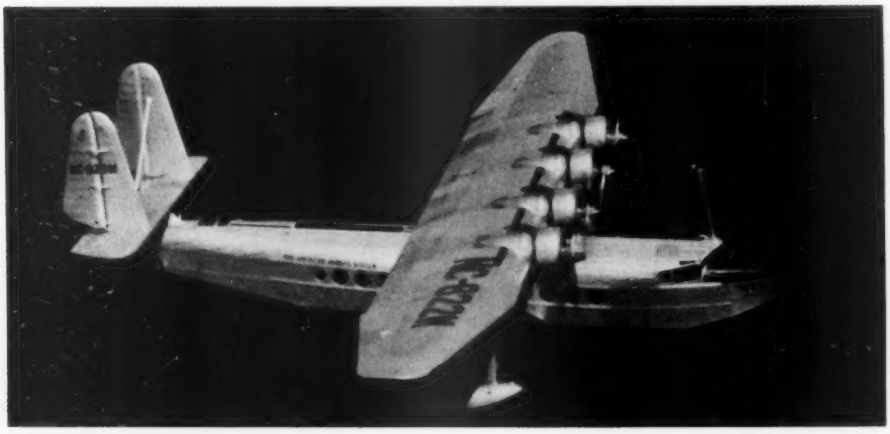
How did Sikorsky build such performance into his great flying boat? He watched birds fly.

Sikorsky noted that large birds like the osprey, which must fly great distances over the sea without alighting, have a much heavier wing loading than comparably-sized land birds—i.e., more weight is sustained aloft per square foot of wing area. How, then, to achieve high wing loading in an airplane without paying for it with excessive landing and takeoff speeds? Sikorsky's answer was a huge, hydraulic, trailing edge flap that gave the S-42 40 percent extra lift and lowered its landing speed to 65 mph.

But that was not all. Thanks to Frank Caldwell, Sikorsky's engineer friend, the S-42 incorporated variable pitch propellers, the "gearshifts of the air." True, the Hamilton-Standard three-bladers had only two pitch positions, one for takeoff, the other for cruise, but these also boosted *Clipper* performance and won for Caldwell the 1934 Collier Trophy.

Earlier Sikorsky boats had featured a forest of struts and guy wires, external bracings for the wing and especially the tail, which was attached not to the fuselage but to twin booms leading aft from it. In the S-42, all that was eliminated. The horizontal and vertical stabilizers sprouted directly and cleanly from the fuselage, thus lessening drag. Parasite drag was reduced by all-over use of flush-riveting, the first time that technique

The clean lines of the S-42 Flying Clipper increased efficiency by reducing drag. This, plus the controllable props and huge flaps, helped the plane set eight records in one day.



had been used in large transports. Aviation buffs called the Sikorsky S-42 the most beautiful aircraft of its time.

However much the British admired the S-42, they took a dim view of it as a trade competitor. Landing rights at Bermuda were denied the S-42. Pan Am promptly christened the aircraft the *Brazilian Clipper* and routed it to Rio de Janerio. When the DC-3 proved more useful in reaching inland cities of South America, Pan Am chose the S-42 to pioneer the Pacific.

On April 16, 1935, a Pan Am S-42 aimed its bow wave westward from Alameda, Calif., and climbed on course for Hawaii. It took that first *Pacific Clipper* 18 hours and 9 minutes to span the 2,400 miles between San Francisco Bay and Pearl Harbor. Its average speed was 132 mph.

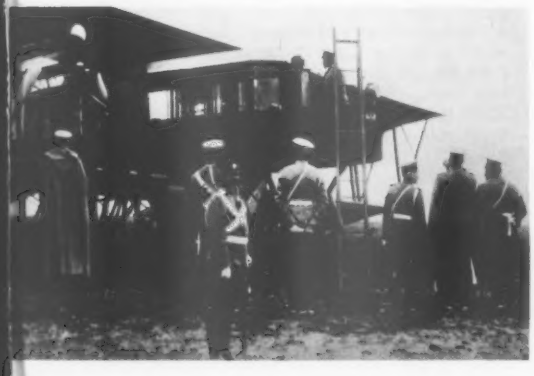
Literally led westward by Col. Lindbergh, following routes the Lone Eagle had pioneered, landing in the coves he had explored, the S-42 island-hopped from Wake to Midway to Guam. Two years after the first survey flight, S-42s were shuttling passengers from Hawaii to Hong Kong to Australia.

At about the same time, in July 1937, an S-42 inaugurated direct flight service from New York to Ireland, making the crossing in 12 hours and 30 minutes. Clippers now were flying from San Francisco all the way to New Zealand, up to the mainland of Asia, from America to Europe. One airplane had closed all major gaps in over water air transportation.

The great age of the flying Clippers seemed at hand. Yet, in a few short years they had passed out of the picture for long distance flight, giving way to land planes. The amphibious nature of the flying boat, which originally was a source of great comfort to safety minded operators (and passengers), eventually created too many problems in seamanship for efficient handling. Currents, tides, small boats, floating logs, winter ice—all this had to be considered in designing the airplane and planning its flights.

So the graceful sea birds soon joined their sister sailing clippers in the pages of history. An era in aviation had come and gone.

Nicholas II of Russia inspected Sikorsky's **Grand** in 1913, when it was the world's first successful multi-engine airplane, boasting enclosed cabin, lavatory, and even a catwalk for in-flight strolling by adventurous passengers.



■ MORE CONTROLLERS. FAA has begun hiring 1,080 air traffic control trainees. First trainees will go into 700 positions which were authorized in fiscal year 1973, and 380 more will replace active controllers who retire or otherwise vacate their positions. Controller strength, which was 19,661 in Feb. 1973, is expected to be 20,369 by June 30, with a projected force of more than 21,000 by June 1974 if Congress approves an additional 1,000 positions for that year.

■ PUSHBUTTON WEATHER FORECASTS (ceiling and visibility) are available for 22 airports in the Eastern and mid-United States, as the result of an automated system developed by National Weather Service's Techniques Development Laboratory by agreement with FAA. Since April, ceiling and visibility forecasts for the next 4 to 16 hours have been prepared once a day at the National Meteorological Center in Suitland, Md. These forecasts are stored in the agency's computerized Kansas City communication facility, and can be obtained on request for use in the preparation of aviation weather forecasts. The data needed for the forecasts are four consecutive hours of surface observations taken at the station just prior to the time the forecast is made. Ten years of hourly data were analyzed to develop techniques for making these forecasts, which are expected to result in more accurate forecasting for the airports involved.

■ GUIDELINES FOR PARTICIPATION in the FAA Planning Grant Program are contained in a new Advisory Circular, AC 150/5900-1. The Planning Grant Program for airports, which was established by the Airport and Airway Development Act of 1970, provides up to $15 million annually to be allocated to planning agencies for airport system planning and to public agencies for airport master planning. The circular tells how to make application and gives procedures to be followed in completing planning projects.

■ RED LIGHTS ON THE RUNWAY. FAA's Advisory Circular, 150/5340-13B, which describes standards for the design, installation and maintenance of high intensity runway lighting (HIRL), has been revised. HIRL systems are used to outline the edges of paved runways after dark and during IFR weather. Changes in the standards include the addition of red runway end lights to the basic lighting configuration, and revision of lighting signals for displaced thresholds.

The free advisory circulars mentioned in this column are available from the DOT Distribution Unit, TAD 484.3, Washington, D.C. 20591.

FUEL-LESS FLIGHT. Fiberglass ASW-12 sailplane was one of six competing in the second annual transcontinental Sailplane Derby. Race began May 14 in Los Angeles, ended 2½ weeks later at Dulles Airport in Washington, D.C. Planes were towed to an elevation of 2,000 to 3,000 feet each day. They averaged 250 to 300 miles at speeds up to 120 mph. Five men and one woman competed in the race, which was won by Goran Ax, of Sweden in a Kestral 17.

Thomas M. Smith of Dallas Named Instructor of the Year

Thomas M. Smith of Dallas, Texas has been named the first Flight Instructor of the Year in a national competition sponsored by FAA and the Aircraft Owners and Pilots Association (AOPA). In his 27 years of teaching flying Smith has logged more than 21,000 hours of instructing time (866 in the past year). His total flight time exceeds 25,000 hours.

Smith, who has written a book (Multi-engine Flying) and several magazine articles on flying, is an FAA Accident Prevention Counselor at Addison, Texas, and is much in demand on the lecture circuit for his talks on handling weather problems. He feels that part of his success in turning out well-qualified airmen stems from his caution to new pilots that "get-there-itis" is the most serious disease they can get. He emphasizes that if you are a person who *must* make time deadlines you had better not try to fly yourself.

Smith was chosen from among 12 regional flight instructor winners. Accompanied by his wife, mother, son and daughter, he was flown to Washington on May 25, where FAA Administrator Alexander P. Butterfield presented him with an engraved silver tray and certificate. He was also given more than $6,000 in prizes by 14 aviation organizations.

General Aviation Growth Projected

General aviation aircraft handled by Air Route Traffic Control Centers are expected to increase from the 1972 level of 4.8 million to 15.9 million annually, according to projections in the FAA Ten Year Plan for 1973-1982. In order to prepare for the future growth of aviation, FAA annually updates its estimates of aircraft, pilots and operations in the decade to come. Other ten-year projections include increases in flight services by FSS's from 50.4 to 125.6 million responses annually, and a rise in commercial passenger enplanement from 182.9 million to 442.0 million per year. Tower operations are expected to almost double by 1982.

Also included in the book are detailed discussions of long-range plans for air traffic control, flight services, NAVAIDS, airports, research and developments, etc. The Ten Year Plan 1973-1982 was discussed at FAA's Planning Review Conference in Washington on May 21-23. It is available from any GPO Bookstore for $2.25, or by mail for $2.60 from Superintendent of Documents, GPO, Washington, D.C. 20402.

Helicopter Flight Rules Changed

Overwater helicopter flight is affected by two amendments to the Federal Aviation Regulations, both of which went into force on May 17, 1973. The rules were based on 1972 proposals. Public comment, which was generally favorable, was considered in the final drafting of the amendments.

Amendment 135-35 permits land helicopters to carry passengers over water if they are equipped with helicopter flotation devices. The second amendment, 91-115, permits a helicopter which is taking off or landing at an overwater heliport to fly briefly through the prohibited range of the limiting "height-speed envelope," if that portion of the flight is over water and the craft is equipped with floats or emergency flotation gear.

Previously, helicopters were prohibited from flying at any time within the height-speed envelope, which represents any combination of height and forward speed under which a helicopter cannot make a safe landing if the engine fails.

Data Flow Automated at Centers

All 20 FAA Air Route Traffic Control Centers have now been changed from manual to computerized processing of flight plan data, which enables flight information to be automatically transferred from one center to another and to airport terminals. This will relieve controllers from mechanical chores and give them more time for actually controlling air traffic. A target date of January 1, 1975 has been set for Phase II automation, which will provide automatic radar display of aircraft identity and altitude data.

FLIGHT INSTRUCTOR REFRESHER COURSES

Third Quarter, 1973

DATE	LOCATION	
7/10-12	Seattle	Wash. State Aero Comm.
7/10-12	Terre Haute, Ind.	Indiana State University
7/17-19	Los Altos, Calif.	Santa Clara Chapter 99's
7/17-19	Moline, Ill.	Ill. Dept. of Aero.
7/24-26	El Paso	Texas Aero Comm.
7/24-26	Memphis	Memphis State University
7/31-8/2	Jacksonville, Fla.	AOPA & Florida DOT
8/7-9	Pittsburgh, Pa.	AOPA & Community Coll. Beaver County
8/7-9	Kent, Ohio	Kent State University
8/14-16	Phoenix	Arizona Dept. of Aero.
8/14-16	Auburn, Ala.	Auburn University
8/21-23	Champaign, Ill.	AOPA & University of Illinois
8/28-30	Costa Mesa, Calif.	AOPA & Orange Coast College
9/5-7	Ames, Iowa	Iowa State University
9/5-7	Albuquerque	New Mexico Aviation Dept.
9/11-13	Reno	AOPA & Nevada Safety Council, U. of N.
9/11-13	Amherst, Mass.	Mass. Aero Comm.
9/18-20	Ft. Worth	Texas Aero Comm.
9/18-20	Colorado Springs, Colo.	AOPA & City of Colorado Springs
9/25-27	Detroit	AOPA & Michigan Aero Comm.
9/25-27	Salt Lake City	Utah Division of Aero

NOTE: All above are Flight Instructor Refresher Courses, designed for airplane and/or instrument-airplane instructors.

Please contact sponsor to confirm course, exact dates, and locations.

• Airplanes or Aircraft?

The March 1973 issue contains an article on ELTs "Down and Squawking", which states that by regulation "an ELT must be installed by December 30, 1973 in all aircraft except . . ." The word should have been "airplane" rather than "aircraft", which includes other craft not affected by the rule, such as balloons, airships, gliders, etc.

David Warner
Oklahoma City

That is true. Part 91.52 of the Federal Aviation Regulations, which is concerned with emergency locator transmitters in general aviation, is restricted to airplanes.

• Altimeter Errors

I would like to clear up a question raised in a letter from J. G. Peterson, regarding the U.S. Air Force procedure for dealing with altimeter errors. Mr. Peterson mentions that he was taught in the Air Force to compensate for altimeter errors on the ground by setting the altimeter to field elevation, noting the difference in the Kollsman number, then applying that difference to subsequent altimeter settings during the flight. The USAF no longer teaches this procedure—the so-called "K" factor—because this type of altimeter error, defined as "scale error," varies at different altitudes, and in fact may change from plus to minus. USAF pilots check for scale error prior to takeoff, and if the error does not exceed ± 75 feet, then the altimeter is considered within tolerance for flight and no further correction is applied.

John P. Kelly, Major USAF
Instrument Flight Center
Randolph Air Force Base, Tex.

• The Cost of Knowledge

Your magazine cautions pilots to "keep abreast of the latest notices in the Airman's Information Manual" but it is being priced out of reach. How can FAA justify such a large price increase? A number of pilots tell me they do not plan to renew.

William C. Weeks
Reading, Pa.

I have subscribed to FAA AVIATION NEWS for several years. I have been very pleased and have recommended it to my pilot friends. Now your price is increased from $2.00 to $3.50—almost double. How do you do it?

Harry Ter Best
Yucalpa, Calif.

The price of AIM and of FAA AVIATION NEWS is set by the Superintendent of Documents under a law established by Congress. FAA has no influence over the price of a document, except concerning such factors as how often it is issued or the number of pages in an edition. The price reflects only the cost of printing press time, paper, postage (a new addition) and a percentage for overhead.

In the case of AIM, several steps have been taken by FAA in an effort to stabilize the overall cost. These include re-scheduling Part 3 from every 28 days to a 56-day cycle, and deleting some non-critical information. These actions have held the price increase of Part 3 to 11 percent. We are acutely aware of the price problem and will continue to seek ways to keep prices down without sacrificing information vital to aviation safety.

• Clearing the Air

You made many of us who jump out of airplanes for pleasure and sport sad indeed when you selected our activity as the "horrible example" to highlight your story on the need to review NOTAMS during pre-flight planning ("If a Body Meets a Body . . .", February 1973).

There has never been a midair collision between a sport parachute jumper and an airplane, and the United States Parachute Association knows of almost no authenticated near misses as described by your wildly imaginative writer. Our 25,000-plus members jump under ATC control. Except on very special occasions they confine their activities to locations clearly marked on Sectional Charts. We "clear the area" by eyeballing each and every time before we exit the aircraft—in case some uninformed pilot wanders through. Why pick on us? We're good neighbors in the air.

William H. Ottley, V.P.
U.S. Parachute Assoc.

The article, based on an actual "close-call" incident, was not addressed to sky divers, but to pilots, who were reminded that preflight planning should include an awareness of any special use being made of the airspace they intend to fly through. This is for their own safety as well as the safety of those making use of restricted airspace, such as drop zones, military climb corridors, oil burner routes, etc. There are 362 jump areas listed in AIM; most are not shown on sectional charts, which depict only those jump areas most regularly in use. Surely all parachutists, including non-members of your group, support efforts to make certain that no "uninformed pilot wanders through . . ." as you say, a jump area.

FAA is presently evaluating public comments on proposed rule changes on this subject which will be discussed more fully in a forthcoming article.

• Landing without Airspeed Indication

Your first "Preflight in Haste" article (November 1972) reminded me of a personal experience, when my airspeed indicator failed during takeoff. (It was later found to be due to water in the static lines.) I took off with light back pressure and held the nose on the horizon. Turns and power reduction were made over familiar landmarks. Landing without an airspeed indicator was easy with partial throttle (1200 RPM) and using the tachometer as a gauge: nose up RPM decreases, nose down RPM increases. The landing was uneventful. If your readers try it I suggest a pilot in the right seat monitoring the gauges.

Dave Perkins
Royal Oak, Mich.

We would recommend the presence of an instructor pilot on board when practicing landing without the airspeed indicator.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• How High the Pattern?

I would like to know where to find the pattern altitude for different airports?

Donald A. Marquis
Barksdale AFB, La.

At present no airport traffic pattern altitudes are specified by the Federal Aviation Regulations. FAA has proposed a rule which would standardize traffic patterns at uncontrolled airports with a universal pattern altitude of 1,000 ft. above ground. (See FAA AVIATION NEWS, August 1971). Comments to the proposal are still being evaluated.

Some airport operators arbitrarily set a "pattern altitude" at their airports. This information is available from the individual airport, and in some cases in state airport directories. It is helpful to know, since local pilots will generally be using that altitude.

• The Needless Search

Your article in the March 1973 FAA AVIATION NEWS is a fine introduction to ELTs but you fail to point out one problem. Even though the TSO has set "G" limits for automatic activation of the units, many inadvertent activations of ELT's occur. In a recent ten-day period as a Coast Guard Search and Rescue pilot I located three ELT's at local airports in Florida which had been accidentally set off. Please encourage aircraft operators to check their ELTs after engine shutdown to insure that they are off. If found "on", the operator should notify the nearest FAA facility, to eliminate needless hours of airborne searching.

Peter S. Heins, LTJG, USCGR
Opa Locka, Florida

• Who Is in Command?

When a pilot is flying under the hood with a safety pilot in the right seat, who is the pilot-in-command?

Daniel Foote
Amityville, N.Y.

During a simulated instrument flight *the safety pilot must be qualified in that particular aircraft (FAR 91.21). During instrument practice under VFR conditions either pilot may, legally, assume the responsibility of pilot-in-command. Pilots should decide in advance who is to be the pilot-in-command for each portion of the flight.*

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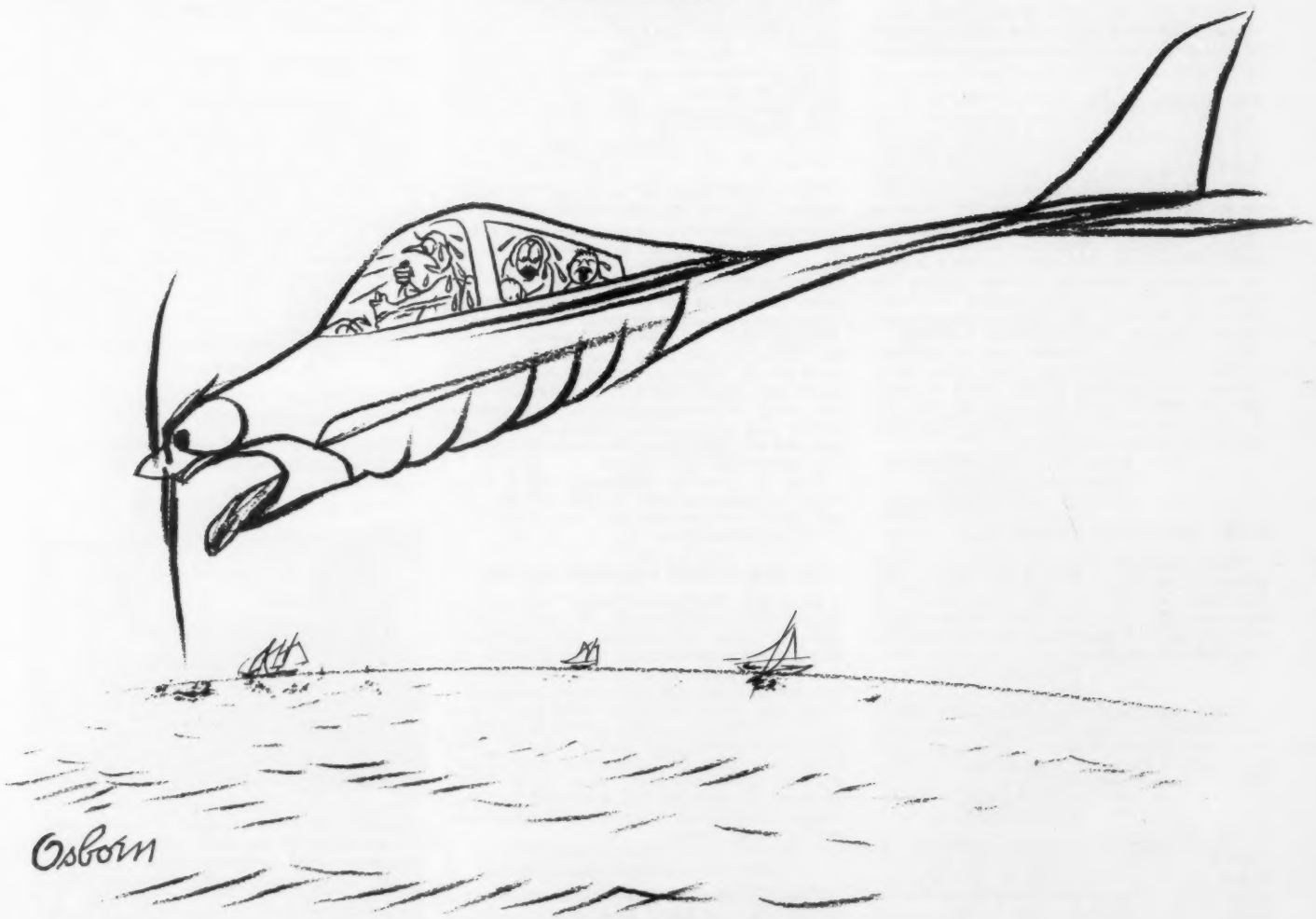

. . . before **you fly.**

Suggested by Earle Liegl
Milwaukee Approach Control, Wisc.